

## HERPETOFAUNA

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### **Influences of environmental factors on Rough Guardian Frog (*Limnonectes finchi*) tadpole abundance in the streams of Danum Valley Conservation Area**

#### **Abstract**

We investigated the distribution of tadpoles of Rough Guardian Frog (*Limnonectes finchi*) related to environmental factors within six streams in Danum Valley Conservation Area. The factors which we examined were tadpole predators, stream size and microhabitat types. These environmental factors were measured and correlations were tested. Streams with high density of leaf litter showed a positive relationship with higher tadpole abundance of the species while streams with a higher proportion of rocks showed the lowest abundance of tadpoles. To have a clearer observation of predator-prey interaction, a predation test was conducted on tadpoles by two predators which were dragonfly larvae (*Macromia* sp.) and diving beetles. Dragonfly larvae results to be the best tadpole predator. The roles of leaves litter were recognised as protection and food source as previous studies suggested. Hence, prey survival-strategies were further tested with the treatment of leaves litter as protection for tadpoles. Our results showed that leaves litter did not significantly influence the predator efficiency. We concluded that leaves litter may act as food source rather than refuge for tadpole.

Ha Hoang Van (Vietnam), Cleveland Metroparks Zoo, USA

Mung Seng Chua, Universiti Malaysia Sabah, Malaysia

2011

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### **Spacing and aggressive behaviour in the Yellow-bellied Puddle Frog (*Occidozyga laevis*)**

#### **Abstract**

There have been no detailed ecological studies regarding the Yellow-bellied Puddle Frog (*Occidozyga laevis*), found in Borneo, to date. Relying on field analysis and pilot observations in a pond located in the Danum Valley Field Centre in Sabah, Malaysia, we hypothesised that *O. laevis* in the pond had a non-random, even distribution and therefore may show territoriality or spacing behaviour. We also considered potential aggressive behaviour between *O. laevis* males as an additional support for our hypothesis. During our study we created 15 density maps which we used to test for non-random distribution. We also performed behaviour trials in the field, matching resident frogs with intruder frogs as well as resident frogs with a negative control (a rock). The Clark-Evans average R value indicated an even and therefore non-random dispersal. We did observe aggressive behaviours during the matches, but there was no significant dominance of the resident over the intruder or vice-versa. Our results suggested that male *O. laevis* show a clear spacing behaviour, likely connected to energetic cost trade-offs. However, given the fluctuations of the occupancy areas and the lack of resident dominance, we cannot infer that *O. laevis* present territoriality.

Bianca Corlett (Canada), Lund University, Sweden

Nicole Ponta (Italy), ETH, Zurich, Switzerland

2011

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## **Interactions between males of tree hole frogs (*Metaphrynella sundana*) in Danum Valley Field Centre area**

### **Abstract**

Males of tree hole frogs (*Metaphrynella sundana*) produce sounds to advertise their presence both to females and to the rival males. The rate of calls of the male frogs might be a good indicator to investigate how the males compete with each other and attract females. This study investigates whether the density of tree hole frogs influences the rate of calls a male makes and whether the distance to the nearest neighbour influences the male calling rate. We show that males in plots with only one individual had a significantly lower calling rate than males in plots with two individuals. These data were corroborated by our playback experiment which shows that the calling rate of males increases after a recording of a different is played. There is no correlation between distance and the rate of calls. For conclusion, our work shows that rate of male calls depends on presence of another calling male, but distance between them does not influence it.

Piotr Kuterba, Jagiellonian University, Poland

Rizka Apriani Putri, Universitas Gadjah Mada, Indonesia

2010

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## **Species richness and microhabitat preferences of frog species in Danum Valley Conservation Area**

### **Abstract**

Resource partitioning allows the co-existence of various species as it reduces competition. Our aim was to find out if there is habitat and microhabitat partitioning among frog species in Danum Valley. Two artificial ponds, two natural ponds, and one stream section were sampled. Our results show that species richness in the stream is higher than in the ponds. Frog species have certain microhabitat preferences but they also occur in less preferred microhabitats. The same microhabitat can support more than one species. Thus, we concluded that the main factor allowing the presence of different species in the same place is the ability of sharing the microhabitat.

Ninda Lara Baptista, University of Lisbon, Portugal

Nurul Silva Lestari, Dipterocarps Research Centre, Indonesia

2010

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## **Adjustment of tree-hole frog (*Metaphrynella sundana*) calling characteristics in relation to tree-hole properties in the field**

### **Abstract**

Previous studies have indicated that male Bornean tree-hole frogs (*Metaphrynella sundana*) change their call frequencies to tune in to the resonant frequency of their cavity under laboratory conditions. We carried out a field study at Danum Valley Field Centre, Sabah, Borneo to investigate the correlation between call frequency and volume of water in natural tree cavities under field conditions. We recorded the calls of 19 frogs before and after adjusting the water volume in steps of 5 and 10 ml in the cavity. We found a significant relationship between the mean call frequency and air column volume. Continuous recording of an individual frog over a 32 minute period, as we added water, also showed an increase in frequency with increasing air column volume. Call frequency in response to changes in volume varied among individual frogs in cavities with different resonance properties. Although the laboratory evidence could not directly be translated into the

field, we demonstrate that tree hole cavities influence the ability of *M. sundana* to vary its call.

Björn Johansson, Linköping University, Sweden

Stephen Hyland, National University of Ireland, Galway, Ireland

2010

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### **Microhabitats of co-occurring tree frogs (*Polypedates* and *Rhacophorus*) around ponds of Danum Valley Field Centre, Sabah, Malaysia**

#### **Abstract**

Six tree frog species, *Polypedates leucomystax*, *P. macrotis*, *P. otilophus*, *Rhacophorus appendiculatus*, *R. pardalis* and *R. dulitensis* were observed to use the same ponds for breeding in around the Danum Valley Field Centre (Sabah). We investigated whether these six species shared the same ecological niche, or whether different microhabitats could be defined. For one week, the location of every individual encountered around three ponds was recorded every night. We found that the frog species occurred at different heights; *P. leucomystax* was different from all other species by occurring close to the ground at a maximum of 1 m. Seventy percent of all individuals were located within 0.50 meters from the water. *Rhacophorus pardalis* and *R. dulitensis* showed a preference for herbs over trees. All species were distributed randomly around the ponds. *R. dulitensis* was the main species in the temporary pond after heavy rain, which is an indication of a difference in breeding pattern.

Lieneke Bakker, Wageningen University, The Netherlands

Cheryl Cheah, Universiti Putra Malaysia, Malaysia

2009

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### **Tree hole frog (Microhylidae: *Metaphrynella sundana* Peters): habitat utilisation and density**

#### **Abstract**

We investigated patterns of habitat use and density in the tree hole frog *Metaphrynella sundana* in the Danum Valley Conservation Area, Sabah Malaysia. We recorded a total of 46 calling sites in five 10 x 100 m transects. When calling from tree holes, *M. sundana* showed no preferences for specific tree diameter at breast height (dbh), tree height, canopy cover, litter depth or slope. Tree hole diameter and hole height (a preference for small holes close to the ground), as well as the height of trees (frogs preferred smaller trees compared to reference samples) affected the frog's occurrence. The density of calling males was lower after heavy rainfall, and there is strong evidence that frogs regularly move between tree holes. Our result suggests that the density of *M. sundana* populations vary temporally and spatially, meaning that environmental heterogeneity is important for conservation management and should not be overlooked.

Phuong Thi Thanh Sam, Nature and People Reconciliation, Hanoi, Vietnam

Robin Lim, Danum Valley Field Centre, Sabah, Malaysia

2009

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